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Reg. No. :

Name :

First Semester M.A. Degree Examination, April 2024

Behavioural Economics and Data Science

BEDS 513 : QUANTITATIVE TOOLS FOR BEHAVIOURAL ECONOMICS

(2020 Admission Onwards)

Time : 3 Hours

Max. Marks : 75

PART - I

Answer all questions from this part. Each question carries 1 mark.

1. Harmonic Mean.
2. Transpose of matrix.
3. Kurtosis.
4. Quadratic function.
5. Poisson distribution.
6. Universal set and power set.
7. Quotient rule on differentiation.
8. Points of infection.
9. Optimization.
10. Identity Matrix.

(10 × 1 = 10 Marks)

P.T.O.



PART – II

Answer any seven questions in less than 400 words. Each question carries 5 marks.

11. Briefly explain Bayes' theorem of Probability.
12. Find the Total Revenue function using Integration: $MR = 84 - 4Q - Q_2$.
13. Solve by factorization the Quadratic equation $2x^2 - 6x - 20 = 0$.
14. Explain the importance of Matrix algebra in Economics and briefly explain different types of Matrices.

15. Find the rank of the matrix
$$\begin{bmatrix} 1 & 2 & -1 \\ 2 & 4 & 3 \\ -1 & -2 & 6 \end{bmatrix}$$
.

16. Solve the following equations by Cramer's Rule.

$$3X + 2Y + Z = 6$$

$$2X - 3Y + 3Z = 2 \text{ and}$$

$$X + Y + Z = 3$$

17. Find the minimum and maximum values of $Y = 2X^3 - 3X^2 - 12X + 4$.

18. Explain the uses and applications of chi-square test.

19. Integrate $\int \frac{x^2}{x+2}$.

20. What is meant by Skewness? How is it measured? Given Mean = 34.5, Mode = 35.0, Variance = 25. Find a measure of Skewness.

(7 × 5 = 35 Marks)

PART – III

Answer any three questions in less than 1200 words. Each question carries 10 marks.

21. Solve the following equations using Quadratic equation method.

$$x - y = 2$$

$$2x^2 + 5y^2 = 1$$

22. Using the matrices solve the equations:

$$X + Y + Z = 6$$

$$X + 2Y + 3Z = 14$$

$$-X + Y - Z = -2$$

23. The screws produced by a certain machine were checked by examining samples. The table shows the distribution of 128 sample according to the number of defective items they contained.

No. of defectives	0	1	2	3	4	5	6	7
No. of samples	7	6	19	35	30	23	7	1

Fit a binomial distribution to find the mean and variance of the distribution.

24. Briefly explain the various approaches to calculating probability.

25. Given the function $y = f(x_1, x_2, x_3) = 10 + 2x_1^2x_2 + 3x_2^2x_3^2$. Find all nine second order partial derivatives.

(3 × 10 = 30 Marks)

